

discoveries, and new ideas from British and foreign sources, a careful bibliographic list of books, current periodicals, and papers on historical and related biological subjects, and, lastly, the Proceedings of the Society's Meetings, complete this well edited and valuable Part for February.

## PROCEEDINGS OF LEARNED SOCIETIES.

### GEOLOGICAL SOCIETY.

December 18, 1878.—Henry Clifton Sorby, Esq., F.R.S.,  
President, in the Chair.

The following communications were read:—

1. "On remains of *Mastodon* and other Vertebrata of the Miocene Beds of the Maltese Islands." By Prof. A. Leith Adams, M.B., F.R.S., F.G.S.

The author recognized the following Maltese formations:—

*Upper Limestone*.—Maximum thickness over 250 feet, passing into a sandy rock, and that into a hard red limestone. Fossiliferous, containing 4 Brachiopoda, several Lamellibranchs and Gasteropods, and 25 Echinodermata (10 being peculiar).

*Sand Bed*.—Maximum thickness about 60 feet, variable in character, characterized by vast abundance of *Heterostegina depressa*; 15 Vertebrata.

*The Marl Bed*.—Maximum thickness over 100 feet, but sometimes almost wholly thinned out. Organic remains rarer than in the Sand Bed.

*The Calcareous Sandstone*.—Maximum thickness rather over 200 feet. Contains bands of nodules, of which the second is rich in organic remains. Hence come the noted teeth of Squalidæ. Among its invertebrate fauna are many Pectens, with other Lamellibranchs, Gasteropods, and Brachiopods; also 22 species of Echinodermata.

*The Lower Limestone*.—Maximum thickness over 400 feet. *Scutella subrotunda* and *Orbitoides dispansus* are abundant in the upper part; and it is generally fossiliferous.

In a nodule seam in the Calcareous Sandstone in the Island of Gozo two rather imperfect teeth of a *Mastodon* have been found. Both are penultimate molars. They agree most nearly with the teeth of *Mastodon angustidens*; but the characters are not sufficiently well preserved to differentiate the species with certainty.

The same formation has furnished teeth of a *Phoca* to which the specific name *rugosidens* has been given by Prof. Owen. Large teeth referable to the Phocidæ are found in the nodule seams of the Calcareous Sandstone and in the Sand Bed; the Marl Bed has also furnished a portion of a jaw.

The Woodwardian Museum contains a part of a jaw of *Squalodon*, evidently from a nodule seam of the Calcareous Sandstone (found by Scilla circ. 1670). The Sand Bed and Calcareous Sandstone have furnished remains of more than one species of *Delphinus*; and large-sized Cetacean vertebræ are found in nearly all the beds, especially the Sand Bed. *Hulitherium* has been obtained from the Sand Bed, Marl Bed, Calcareous Sandstone, Lower Limestone, and (?) Upper Limestone.

One specimen of *Ichthyosaurus gaudensis*, Hulke, has been furnished by the Calcareous Sandstone; the same has also furnished *Melitosaurus champsoides*, *Crocodylus gaudensis*, and *Sterrodus melitensis*. *Myliobates toliapicus* and allied species have come from all the deposits except the Upper Limestone; *Otobates subconversus* from the Sand Bed and Marl. The Squalidæ are abundant from all the deposits except the first. There are ten species, belonging to the following genera—*Carcharodon*, *Carcharias*, *Oxyrhina*, *Hemipristis*, *Corax*, *Odontaspis*, *Lamna*. Remains of *Notidanus*, *Platax*, and *Diodon* have also been found.

2. "Dinosauria of the Cambridge Greensand." Parts I.–VII. By Prof. H. G. Seeley, F.L.S., F.G.S.

The author stated that this paper was founded upon the collection of more than 500 Dinosaurian bones preserved in the Woodwardian Museum, for the opportunity of studying which he was indebted to the kindness of Prof. T. McKenny Hughes. He described the conditions under which the specimens occur, and accounted for the apparently worn state of the bones as the results of exposure to the air, and subsequent maceration.

I. "Note on the axis of a Dinosaur from the Cambridge Greensand." This bone was said to be very similar to the axis from the Wealden previously described by the author (Q. J. G. S. xxxi. p. 461), but differed in the neural arch being supported on pedicels of the centrum, in both articulations for the rib being on the centrum, in the compressed form of the odontoid process, and in the subhexagonal form of the oblique posterior articular surface of the centrum. There is no indication of a wedge-bone beneath the anterior articulation. The condition of the axis in other Dinosaurs, such as *Zanclodon*, was indicated, and reasons given for regarding the structure of the bone as a modification of the Crocodilian type.

II. "On the vertebral characters of *Acanthopholis horridus*, Huxley, from the base of the Chalk-Marl near Folkestone." The author stated that only dorsal and caudal vertebræ of *Acanthopholis* are at present known. The dorsal vertebræ have the visceral surface well rounded, the articular ends subovate, and the centrum laterally compressed. The early caudal vertebræ are deep, with strong compressed transverse processes, zygapophyses directed well forward, and the neural spine directed upward and backward. The

centrum is inclined obliquely forward; the facets for the chevron bone large, and the anterior articulation circular. The later caudals have nearly the same absolute length of centrum; and the transverse process is first reduced to a tubercle, and afterwards disappears entirely. A deep channel is developed on the underside of the centrum; and two more or less marked ridges run along each side of the centrum, making the articular ends subhexagonal.

III. "On the skeleton of *Anoplosaurus curtnotus*, Seeley." This genus and species are founded upon an associated series of about 80 bones from near Reach. The remains include a portion of the left ramus of the lower jaw, 5 cervical (axis and atlas missing), 13 dorsal, 6 sacral, and 8 caudal vertebræ (the tail being imperfect), the coracoids (one imperfect), the proximal end of the scapula, the proximal and distal ends of the humerus, the proximal and distal ends of the femur, a small fragment of the ileum, small portions of ribs, and fragments of the metatarsals and phalanges. The teeth were placed close together in sockets, 13 occurring in a space of  $2\frac{1}{4}$  inches. The general form of the vertebral centra indicates a convex curve in the back and sacrum, and a concave curve in the neck and tail, rendering it probable, in conjunction with the great development of the sacrum, that the animal affected a semierect attitude. The sacral vertebræ, as preserved, are all separate. The scapula is remarkably thick, with a strong spinous or acromioid process. The femur shows distinctive Dinosaurian features, but presents a form that has not previously been described. The vertebral centra indicate a near affinity to *Acanthopholis*; but no dermal armour has been met with, and the caudal vertebræ present differences which seem to justify its location in a distinct genus.

IV. "On the axial skeleton of *Eucercosaurus tanyspondylus*, Seeley." This genus is founded on an associated series of 19 vertebræ and a neural arch from Trumpington. Four dorsal vertebræ are preserved, which considerably enlarge towards the sacral region, so that probably the vertebral column was carried in a more than usually erect position. The underside of the centrum in the early part of the series has an angular or squeezed form; but this appearance is lost in the hinder centrams. The sacral region is represented by 3 vertebræ; there were probably, in all, 5 or 6. Twelve early caudal vertebræ are preserved; these become unusually elongated and prismatic posteriorly. The chevron bones were at first very large, but are small when the articular face of the centrum has acquired the hexagonal outline. The neural arch in the caudal region was very depressed. This genus was considered to be closely related to *Acanthopholis*, though the vertebræ differed so greatly in form.

V. "On the skeleton of *Syngonosaurus macrocerus*, Seeley." This genus is founded on a series of 19 vertebræ, representing the neck, back, sacrum, and tail. It shows affinities to several Dinosaurian types, especially *Eucercosaurus* and *Iguanodon*. The early dorsal vertebræ are remarkably compressed; and the neural arches are entirely united to the bodies of the vertebræ throughout the

series. In the lower dorsal region the ridge on the visceral surface disappears, and the centrum becomes deep. The visceral ridge reappears in the sacrum. The caudal vertebræ are at first compressed, and have the articular faces oblique and slightly procelous; the chevron bones have a large single facet united by suture to the lower half of the articulation. In these vertebræ the visceral surface is rounded and narrow. The proximal end of a humerus and distal ends of both humeri were obtained; they are of small size. Several metatarsal bones and phalanges have also occurred, and are large in proportion to the other remains. In doubtful association with these bones were 11 pieces of dermal armour, closely resembling that of *Acanthopholis*.

VI. "On the dorsal and caudal vertebræ of *Acanthopholis stereocercus*, Seeley." This species was founded on a small associated series of vertebræ, one of which is an imperfect cervical, 2 dorsal, and 8 caudal. The species differs from *A. horridus*, Huxley, in the form of the centrum, in the different character of the facets for the chevron bones, and in the deeper median channel of the visceral surface. The caudal vertebræ slightly decrease in length posteriorly.

VII. "On a small series of caudal vertebræ of a Dinosaur, *Acanthopholis eucercus*, Seeley." This species was founded on an associated series of 6 caudal vertebræ, which differed from those in the tail of *A. horridus* in the centrum being more elongated and constricted, and in the rapid diminution in length of the centra posteriorly. The species is slightly larger.

January 8, 1879.—Henry Clifton Sorby, Esq., F.R.S.,  
President, in the Chair.

The following communication was read:—

"Description of Fragmentary Indications of a huge kind of Theriodont Reptile (*Titanosuchus ferox*, Owen), from Beaufort West, Gough Tract, Cape of Good Hope." By Prof. R. Owen, C.B., F.R.S., F.G.S.

The author stated that among the fossils recently sent to the British Museum from the Cape of Good Hope by Mr. T. Bain, there were two boxes containing specimens of a most unpromising character, there being in them no entire bones, but only numerous more or less water-worn fragments. Among these was found a portion of a maxillary showing some traces of teeth; and sections having been made of this bone, the remains of several teeth were displayed, including a canine, the preserved portion of the socket of which was  $4\frac{1}{2}$  inches long. From the number and mode of implantation of the teeth, the author concluded that the animal to which they belonged resembled the Theriodont genera *Galesaurus* and *Galenops*. The anterior portion of the left ramus of the lower jaw, measuring  $7\frac{1}{2}$  inches in length, showed teeth presenting close analogies with